

A Case Control Study In Factors That Affect Mammogram Compliance

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INTRODUCTION

Breast cancer is the commonest cancer affecting Malaysian women. It accounts for 31.3% of all female cancer in Malaysia according to the report published by the National Cancer Registry 2003 – 2005¹. Breast cancer shows marked geographical variation with an Age Standardize Rate (ASR) of 47.4 per 100,000¹ among Malaysia women to be at as compared to 94.93 in 100,000 women² in western countries like Europe and the United States.

Survival rates from breast cancer is mainly dependent on early diagnosis and treatment. These are clearly the areas where work is needed in order to improve the outcome from breast cancer. Early detection can be promoted by screening mammography, clinical breast examination and breast self examination. Among these, the use of mammogram as a screening tool in early detection of breast cancer has brought the diagnostic process of this disease into a new era³. Early detection of breast cancer helps reduce the complications of intensive therapeutic treatment and minimizes pain and suffering, thus allowing women to continue leading happy and productive lives.

Population based studies have shown that screening mammography significantly reduced breast cancer mortality⁴. This paper quoted a 30% reduction in the breast cancer mortality among subjects who had screening mammogram versus the control subjects. Subsequent large randomized controlled clinical trials and meta-analysis confirm the decrease mortality from breast cancer.

In Malaysia, population-based mass screening for breast cancer is not a policy yet⁵. Among the reasons for not having such a policy is that its value is expected to be negligible with the limited resources at present⁵. For mammography screening to reduce the mortality rate from breast cancer by 40%, it should succeed in reaching 65 – 90% of the eligible population regularly⁶. The scenario in Malaysia is unique. Currently, most of the screening cases for breast cancer in Malaysia done is opportunistic screening. Example includes patients who are seen in the gynaecological outpatient clinic and are about to embark on Hormone Replacement Therapy (HRT). Another group of patients are those with a history of breast cancer and mammogram is done to screen the contralateral breast. The rest of the mammogram service caters for diagnostic purposes i.e. patients who have breast symptoms and need to undergo mammogram examination for further evaluation of their breast problems. Thus, the low

rate of screening mammogram done, only 3.8% of Malaysian women,⁵ is an expected finding.

To date, there is no published local Malaysian data assessing the rate of mammogram compliance to both screening and diagnostic mammogram. Foreign studies show that specific aspects of knowledge and beliefs about mammograms, individual health-related factors and greater support for screening mammograms by health care workers were the main factors to initiate and maintain the mammogram compliance^{7,8}. It would be interesting to explore the local factors that affect both compliance to screening and diagnostic mammogram. It is important to understand the reasons why women would not turn up for mammogram examination once appointment has been scheduled. This may be a critical finding, given the high prevalence of locally advance breast cancer among Malaysian women found in various studies conducted by various authors^{9,10,11}. Furthermore, Hisham et al have found that only a small percentage (5.2%) of their studied population present with impalpable breast cancers diagnosed on mammography (early stage) while a large proportion of them came with breast cancer at a later stage⁹. There are several issues here. One is that this study may reflect the weakness of public education in disseminating information regarding the importance of mammogram in early breast cancer. Although outreach programmes are ongoing and articles on breast cancer in local newspapers, the internet, women magazines and television are quite commonplace, these programs are not entirely successful in reaching equally all groups of women and those living in lower socioeconomic areas. The other equally important reason is that this may also reflect our failure as health care professionals, in educating and convincing patients to turn up for mammogram examination. Thus, there is a need to address mammogram compliance and the factors affecting it, because, unless the patients are motivated and educated to attend the mammogram examination, the incidence of late breast cancer and its attendant morbidity and mortality will continue to increase. Therefore, the aim of this study is to investigate the rate of compliance to both screening and diagnostic mammogram and to assess factors surrounding the issue of compliance.

MATERIALS AND METHODS

This is a prospective case-control study conducted in Hospital Pakar Sultanah Fatimah Muar which covered the northern part of state of Johor (Tangkak, Segamat, Gemas, Labis). All

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Table I: shows the sociodemographic characteristic of the sample

Characteristic	Case (n=27)	Control (n=73)	p value
Age (years)	53.6 ± 9.2	53.5 ± 10.9	0.14
Income (MYR)	623 ± 127	1462 ± 263	0.01**
Distance of home from hospital (km)	51.1±35.2	26.5 29.4	0.01**
Race			0.10
Malay	21 (77.8%)	40 (54.8%)	
Chinese	6 (22.2%)	31 (42.5%)	
Indian	0 (0%)	2 (2.7%)	
Marital Status			0.15
Married	26 (96.3%)	70 (95.9%)	
Single	0 (0%)	3 (4.1%)	
Divorced	1 (3.7%)	0 (0%)	
Educational Level			0.68
Primary	10 (37.0%)	23 (31.5%)	
Secondary	15 (55.6%)	38 (52.0%)	
Highschool or University	1 (3.7%)	8 (11.0%)	
Others	1 (3.7%)	4 (5.5%)	
History of Previous Mammography	9 (33.3%)	50 (68.5%)	0.002**
Referral Center			0.17
Surgery	19 (70.4%)	62(84.9%)	
Obstetric and Gynaecology	7 (25.9%)	7 (9.5%)	
Outpatient Clinic	1 (3.7%)	2 (2.8%)	
Other state hospital	0	2 (2.8%)	
Risk Factor of Breast Cancer			0.50
Family history	1	10	
Early menarche	0	3	
Late menopause	0	1	
Nulliparous	2	3	
Usage of oral contraceptive pills	2	3	
Reason for mammogram			0.093
Diagnostic Mammogram	18 (66.6%)	36 (49.3%)	
Screening Mammogram	9 (33.3%)	37 (50.7%)	

**significant level $p < 0.05$.

Table II: Relationship between knowledge and beliefs of patient for mammography with their presence to mammography appointment

Characteristic	Case (n=27)	Control (n=73)	p value
Concern of radiation exposure	6 (22.2%)	12 (16.4%)	0.50
The sufficiency of breast examination to replace mammography	7 (25.9%)	13 (17.8%)	0.49
The necessity of mammography despite absence of any symptoms	17 (63.0%)	56 (76.7%)	0.04**
Early detection of breast cancer will improve the prognosis	23 (85.2%)	67 (91.8%)	0.04**
Mammography can cause cancer	7 (25.9%)	4 (5.5%)	0.01**
Explanation of mammography by medical personnel	16 (59.3%)	50 (68.5%)	0.47

**significant level $p < 0.05$.

patients who were scheduled for mammogram examination from August 2010 to October 2010 were included in this study. The reason for mammogram examination was either for screening or for diagnostic purposes. All the patients were either referred from the Surgery Clinic or Obstetric & Gynecology Clinic from Hospital Pakar Sultanah Fatimah Muar, Hospital Tangkak or Hospital Segamat. The case-study group comprised of patients who did not turn up for the mammogram appointment (defaulted patients) and the control group were the patients who attended the appointment scheduled.

All the case-study subjects (mammogram defaulted patients) were interviewed via telephone by an interviewer using their native language. The main investigator conducted all interviews in this study. A maximum of 3 attempts were made to contact each potential respondent. The telephone

interview lasted between 10 to 15 minutes. A pilot study consisting of 20 respondents was conducted with a preliminary questionnaire to identify the necessary amendments and subsequently made into the finalised study questionnaire. The control group (those who turn up for the mammogram appointment) were interviewed during their waiting period for the mammogram at the radiology department.

The questionnaire comprised of socio-demographic characteristics, risk factors for breast cancer, reason for mammogram examination, reason for defaulting mammogram appointment (for those patients who did not turn up for the mammogram appointment) and beliefs / attitudes of respondent (Refer to Appendix 1 for questionnaire). Verbal consent was obtained from each subject prior to interview.

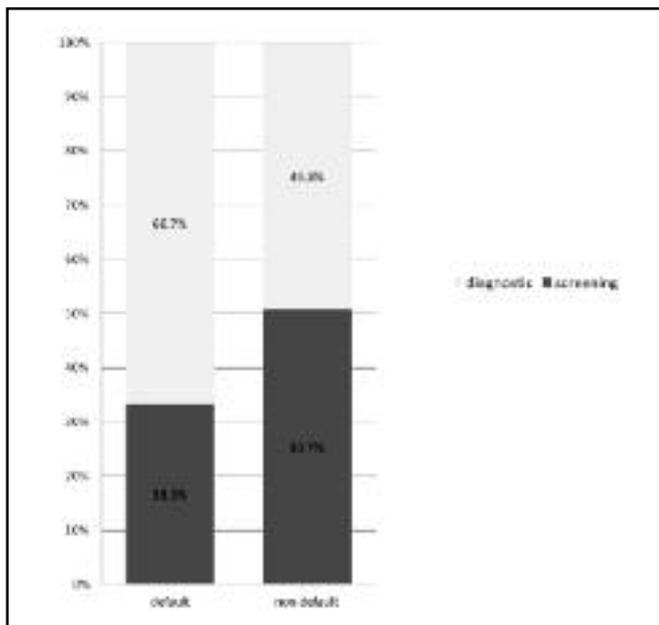


Fig. 1: Reason for mammogram in both the defaulted and non-defaulted group.

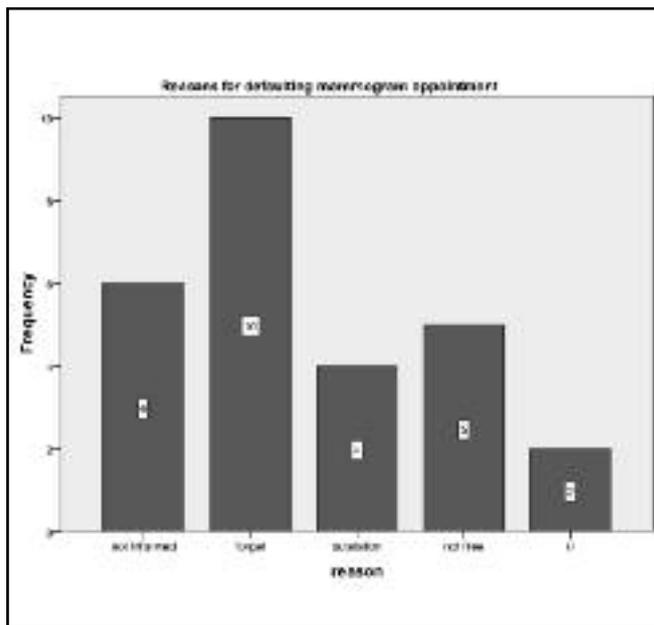


Fig. 2: Reasons for defaulting mammogram appointment among the defaulted patients.

The data was collected and analysed using the SPSS statistical programme. To study the effect of the variables on compliance with mammography, we performed stepwise logistic regression. We used the chi-square test to determine associations between compliance with history of previous mammography, risk factors of breast cancer and knowledge of patient for mammography. In this study, student t-test was used to analyse continuous variable (quantitative data).

RESULTS

In this study, 27 patients (27%) defaulted the scheduled mammogram appointment. Therefore, the case-study group (patient who default the mammogram appointment) comprised of 27 subjects whereas the control group (patient who turn up for the appointment) comprised of 73 patients. The mean age for the defaulted group was 53.6±9.2 years and for the control group was 53.5±10.9years. Age for both groups was normally distributed. 77.8% of the defaulted group were Malays and the remaining 22.2% were Chinese. In the control group, the majority of the patients were Malay (54.8%) followed by Chinese (42.5%) and Indian (2.7%). The Surgery Clinic contributed the majority of referrals for mammogram which was 70.4% in defaulter group and 84.9% in non-defaulter group. The sociodemographics characteristics of the study sample are summarised in Table I.

In this study, the income of patients and the distance of patients' home from the centre providing the mammography service showed a significant relationship with compliance to mammography (p<0.05). The non-compliant patient had a lower income (RM623 ± 127) compared to the control group (RM1462 ± 263). The non-compliant group were patients with a further distance of their home from the health care provider in comparison to the control group. The mean distance was 51.1km and 26.5km respectively. There was

significant correlation between previous experience of mammography and compliance in our study (p<0.05).

Of the defaulter subjects, 18 (66.7%) were for diagnostic mammogram (patients with breast symptoms) and 9 (33.3%) were for screening mammogram (either on HRT, history of previous contra lateral breast Ca or family history of breast cancer). On the other hand, for the control group, 36 patients (49.3%) were for diagnostic mammogram and 37 patients (50.7%) were for screening mammogram (Figure 1). There was no significant relationship between the reasons for mammogram (diagnostic versus screening) with compliance of patient to mammography (Table I). Figure 2 summarizes the reasons why the defaulter patients missed their mammogram appointment.

In our study, we found that certain characteristics of knowledge and beliefs of the patient also influenced their attendance at the mammography session. Those who understand “the necessity of mammography despite absence of any clinical symptoms” and “the importance of early detection of breast cancer will ensure a better prognosis” showed significant difference in their attendance at the mammography session (p<0.05). In contrast, the misunderstanding that mammography can cause cancer had significantly held back patients from attending the mammography appointment (p<0.05). The relationship between the knowledge and beliefs of patient regarding mammography and their presence for the appointment is listed in Table II.

DISCUSSION

In this study, we reviewed the socio-demographic status of both compliant and non-compliant patients for mammography. There was no significant association between

the age of patient and compliance to mammography ($p>0.05$). Our finding is similar to other studies done by May *et al*¹², Burrack *et al*^{13,14} and Dolan *et al*¹⁵. Only Margolis *et al* had found a positive correlation between age and compliance of the patients¹⁶.

There was a positive relationship between the patient's income and their compliance to mammography appointment. Another study had shown that patients with health insurance coverage have a better compliance than those without insurance¹². That study was conducted in a country where the charges for mammography were either borne by the patients or covered by their health insurance. On the contrary, this study was done in one of the Malaysian government hospitals where the mammography charges were not charge to the patient. Therefore it is likely that the relationship does not reflect the ability of the patient to afford mammography. Instead, there are two possibilities. It may indirectly indicate that patients from higher socioeconomic classes have no economic constraint regarding access to the health care facility although they live far from the hospital.

On the contrary, women from low socioeconomic classes may have problems of accessing health facility which can include problem with transportation (especially if live far away from the facility) and time. They may have limited time as they may be burdened with many other responsibilities such as long working hours and family care that cause them to have no free time to attend their mammography appointments. Higher socio-economic status may have a better access to information such as health promoting advertisements via telecommunication, printed media and internet in understanding the importance of mammography in early diagnosis of breast cancer. This may affect their attitude to comply to the mammogram examination.

Easy access to mammography service has always been shown to be important factor in ensuring patients' compliance to the mammography appointment^{16, 17, 18}. Our study supports the above publications by showing significant difference between the patient's home distance and their compliance to mammography. Those who originate from rural and remote area were commonly the group of non-compliant cases because of the difficulties encounter during their journey to the healthcare centre. This includes transportation fees and longer travelling time. In Northern Johor, the main hospital covers a wide area and patients can come from as far as Gemas, Labis and Muazam Shah (Pahang State). These patients need to travel a long distance to Muar for mammogram examination. The situation is worse as there is no highway and the trunk road increases the travelling time and most of the remote areas do not have regular direct public transportation. Furthermore, although there is no significant correlation between age and compliance to mammogram, the mean age group of the defaulted patient is above 50 years old and they may have to rely on their spouse or children to take them to the hospital.

This study showed that women with previous mammogram experience were significantly more compliant than those who have no mammogram experience. It is likely that these

women knows what is to be expected and more in control as the previous experience will reduce fear, emotional uncertainties these women are more familiar with the mammography procedure. The study done by Achat *et al* has shown similar findings⁸.

This study showed no significant correlation between marital status, race, referral centre, risk factor for breast cancer and educational background. These findings were similar to the findings of other studies^{15,16,19}.

The proper understanding of the importance of early diagnosis in ensuring better prognosis for breast cancer and the ability of mammography in screening breast cancer for asymptomatic cases were important factors in improving the patients' compliance. The importance of these had also been emphasized by other study in overseas⁸.

This study showed that there is significant correlation between mammogram compliance and the belief that mammogram can cause cancer. More patients in the defaulter group belief that mammogram can cause cancer compared to the compliant group. The medical professional needs to take an active role in counseling and convincing the patient to correct this misconception. Of course, there is always risk of carcinogenicity but patients must understand that advantages from a mammogram outweighs the disadvantages as mammography has been proven to detect early breast cancer and early detection helps reduce the complications of intensive therapeutic treatment and minimizes pain and suffering. The misunderstanding that "mammography can cause cancer" needs to be overcome to reduce the fear and non compliance of patients. As mammography is a screening tool for breast cancer, the medical personnel who are the first to encounter this patient needs to provide sufficient information and explanation before sending them for mammography examination. Health care staffs need to be well equipped with knowledge of breast cancer and mammogram. It does not matter either screening or diagnostic group as both are not significantly correlated with the compliant issue. Therefore, health care personnel and nursing staff play a very important role in convincing and persuading patients who are reluctant and have misconception to mammogram procedure. This has been suggested by other studies^{10,20,21}. Besides that, collaboration between Ministry of Health and various departments such as Ministry of Public Works and local government is important in improving the accessibility of health care services to the rural population. Department of Social Welfare may play an important role in supporting the lower socio-economic group who has financial constraint in accessing the health care service.

The health care system can use the information gathered here to continue upgrading the service of mammogram. The majority of the patients who had defaulted mammogram appointment in this study stated that they have forgotten about the appointment. This may suggest that a mechanism of informing patient need to be device to inform and remind patient of their appointment.

There are several weaknesses in this study. The small number of defaulter group against the control group is seen as a limitation of this study. Further larger sample size study is needed to verify the findings. It would also be interesting to find out whether the finding from this study would differ in other part of Malaysia such as the Klang Valley where mammogram service is more readily available.

CONCLUSION

Patients from lower socio-economic groups and those from rural area are among the group of patients who defaulted mammogram appointment. Health care personal plays an important role in correcting the misconception about mammogram. They should actively counseled and convince the patient to adhere to the mammogram appointment to improve compliance. However, a larger sample size is needed to verify the findings.

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Questionnaire

ID: _____

DOB: _____

Address: _____

Reasons for screening: 1) History of breast cancer (post mastectomy or lumpectomy)
2) Family history of breast cancer
3) Patient on hormonal replacement therapy (HRT).
4) Others: Reason _____

Age:

Race: 1) Malay 2) Chinese 3) Indian 4) Others

Marital Status: 1) Married 2) Single 3) Divorced 4) Widowed

Level of education: 1) Primary school
2) Secondary school
3) High school or university
4) Others _____

Monthly income:

Previous mammogram: 1) Yes 2) No

Interval waiting for mammogram appointment:

Distance from house to hospital:

Referral center:

Breast cancer risk factors: 1) Family history of breast cancer (first degree)
2) Age of menarche
3) Age of menopause
4) Age at first pregnancy
5) Number of children _____

Does anybody inform you regarding mammogram appointment?
1) Yes 2) Nobody inform. Unsure date of mammogram

Reasons for defaulted mammogram (if already know the date of appointment):

Knowledge and beliefs:

Do you agree that if your doctor gives you a breast examination, then you don't need a mammogram?
1) Yes, I agree.
2) No , I didn't agree.
3) I don't know.

Do you agree that mammogram is necessary in the absence of symptoms? (No discharge, no lump, no pain)
1) Yes , I agree.
2) No, I didn't agree.
3) I don't know.

Can breast cancer be cured if it is detected early?
1) Yes 2) No

Mammogram can cause cancer?
1) Yes 2) No

Did any medical professional explain the importance of receiving a mammogram?
1) Very much
2) A little
3) Not at all

Do you concern about mammogram radiation: 1) Yes 2) No